RING LIFT ANCHOR

The present invention relates towards an erection lift anchor assembly for embedment in a concrete member, such as a precast or tilt-up wall. The erection anchor of the present invention allows for concrete members, such as walls, to be positioned by the use of standard lifting equipment (cranes with cable attachments, etc.) by connecting lifting attachments to the erection lift anchor which is embedded in a concrete member.

SUMMARY OF INVENTION

The present invention is directed towards a lifting anchor for embedment in a concrete member. The anchor comprises a flat bar having a top and bottom; an upper and lower end; a front and rear face and a first and second side. The bar has a first aperture positioned for insertion of a locking device that can be attached to a shackle for lifting the concrete wall or element containing the anchor. The bar may have additional apertures for insertion of reinforcing bars. The bar may further include a an upwardly curved face adjacent the bottom of the bar, and a conical foot shaped to fit adjacent the upwardly curved face.

In one embodiment of the invention, the anchor comprises a bar having a top and bottom; an upper and lower end; a front and rear face and a first and second side. The top of the bar may include a first apex section, a first upwardly projecting face, a top platform section, a second upwardly projecting face, and a second apex section. The bar has at least one aperture near the upper end of the bar. The bar may contain additional apertures. The bottom of the bar may include an upwardly curved face shaped to engage an upper portion of a conical foot.

When the anchor of the present invention is embedded in a concrete form, the top of the bar is positioned adjacent the face of the concrete form. A void former, suitably made from rubber, is placed around the anchor and covers a portion of the anchor, including the first aperture in the upper end of the anchor. When the concrete is poured around the anchor, the area covered by the void former stays free of concrete, while the rest of the anchor, including the any additional apertures, are encompassed by the concrete. When the concrete form is hardened, the void former is removed and a void recess is formed around a portion of the anchor, allowing lifting hardware to be attached to the anchor, via the aperture in the upper end of the anchor. This allows for a lifting attachment to be suitably connected to the concrete anchor.

Other features and aspects of the invention will become apparent to those skilled in the art upon review of the following detailed description, drawings, and exhibits.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a top view of one embodiment of the concrete lift anchor of the present invention.

FIG. 2 shows a front view of one embodiment of the concrete lift anchor of the present invention.

FIG. 3 shows a side view of one embodiment of the concrete lift anchor of the present invention.

FIG. 4 shows a perspective view of one embodiment of the concrete lift anchor of the present invention.

Before one embodiment of the present invention is explained in detail, it is to be understood that the present invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The present invention is capable of other embodiments and of being practiced or being carried out in various ways. In addition, it is understood that the phraseology and terminology used herein are for the purpose of description and should not be regarded as limiting. The use of "including", "comprising", "having" and "has" and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items and equivalents thereof.

DETAILED DESCRIPTION

The present invention is directed towards a concrete lift anchor. The concrete anchor is suitably made from steel. The anchor is suitably a unitary piece made by a drop forging procedure. This allows the anchor to be produced in one operation, and allows the anchor to be produced out of a higher strength material, suitably 100,000 psi steel, without additional heat treatments. By using 100,000 psi steel the safe working load of the anchor is increased 25% over anchors made from 75,000 psi steel.

One exemplary embodiment of the concrete anchor of the present invention is shown in FIGs. 1-4. The anchor 10 comprises a flat bar 12, preferably made of steel, which has a top 14 and bottom 16; an upper 18 and lower end 20; a front 22 and rear face 24 and a first 23 and second 25 side. The bar 12 has a generally constant width W and thickness T. The top 14 of the bar 12 has a first apex section 26, a first upwardly projecting face 28, a top platform section 30, a second upwardly projecting face 32, and a second apex section 34. The bar 12 also has a first aperture 36 near the

upper end 18 of the bar. The first apex section 26, first upwardly projecting face 28, top platform section 30, second upwardly projecting face 32, second apex section 34 and first aperture 36 define an attachment region of the anchor 10 adapted to engage a lifting mechanism. That is, the design of the first apex section 26, first upwardly projecting face 28, top platform section 30, second upwardly projecting face 32, second apex section 34 and first aperture 36 allows for the secure attachment of a lifting mechanism for moving and positioning a concrete form in which the concrete anchor 10 is embedded. The lifting attachment (such as a hook or other suitable attachment) is suitably connected to the concrete anchor 10 via the first aperture 36. The bar 12 has a second aperture 38 positioned beneath the first aperture 36. The second aperture 38 allows for the insertion of a reinforcing bar.

The bottom 16 of the bar 10 has an upwardly curved face 40 shaped to engage a conical foot 42. The upwardly curved face 40 has a maximum point located centrally and symmetrically between the first 23 and second 25 sides of the bar 12. The conical foot 42 has a circular base 44 and a modified upper end 46 dimensioned to fit adjacent the upwardly curved face 40 of the bar 12. The circular base 44 has a diameter greater than the width W and thickness T of the bar 12, such that when the bar 12 is engaged with the conical foot 42 and positioned centrally with respect to the conical foot 42, all faces and sides of the bar 12 fit within the circumference of the circular base 44, as best illustrated in FIG. 1. The conical foot 42 acts to provide shear resistance between the anchor 10 and the concrete member in which the anchor 10 is embedded when the concrete member is being lifted by the anchor 10. The conical foot 42 of the anchor 10 allows for the development of a large shearcone when the anchor 10 is used to lift the concrete form it is embedded in. It will be readily apparent to those of ordinary skill in the art that the bottom 16 of the bar 12

can be secured to the conical foot 42 via a variety of fasteners or adhesives well-known in the art (e.g., screws, bolts, nails, cement, glue, welding, or combinations thereof), or the conical foot 42 can be integrally formed with the bar 12.

Variations and modifications of the foregoing are within the scope of the present invention. It is understood that the invention disclosed and defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text and/or drawings. All of these different combinations constitute various alternative aspects of the present invention. The embodiments described herein explain the best modes known for practicing the invention and will enable others skilled in the art to utilize the invention.